WHY GASTRO-ENTEROSTOMY IS NOT A HARMLESS OPERATION.*

BY M. M. PORTIS, M.D.,
OF CHICAGO,
Professor of Medicine in the Post Graduate Medical School of Chicago.

THERE has been such an appalling increase in the number of gastro-enterostomies in the past few years, that, in the mad rush the conservative indications against such a procedure have been too often forgotten. One author advises that gastro-enterostomy be done for gastroptosis; another recommends it for chronic catarrh; another that it be done in hysterical vomiting; and very many advise it in the neuroses of the stomach that mask under the name of dyspepsia. Indeed, gastro-enterostomy is said to be such a panacea for all the ills that can befall a stomach, that we naturally wonder that we are not born with a gastro-jejunostomy.

The interference with the physiology of digestion which such an operation entails is not well tolerated. The acid medium of the stomach with its pepsin is absolutely necessary for the proper digestion of the proteid foods. Again, the envelops and protoplasm of the cells of adipose tissue as well as the envelops of starch granules must first be digested in the stomach if the natural and full digestion of fats and starches is to occur in the bowel.

The vigorous churning-power of the stomach brings about not only a thorough disintegration of the various foods, and their thorough admixture with digestive fluids, but, as was shown by Kelling,[1] during this process the coarser foods are constantly being thrown back from the pylorus to the fundus by folds of mucous membrane in the pyloric region, aided by a reverse peristalsis. Only the finely-divided foods can pass the pylorus under normal conditions. Kelling produced a fistula of the pyloric region and another of the fundus in dogs and observed that only pulverized food came through the opening of the pyloric end, while coarse pieces came through that of the fundus.

---

* Read before Chicago Medical Society, June 13, 1906.

He also found that the pylorus becomes spastic and closed when acid solutions are introduced into the stomach, and Hirsch and Von Mering demonstrated that the introduction of foods into the duodenum hinders the emptying of the stomach. Neither of these phenomena occurred in animals with gastro-jejunostomy, and the absence of these normal reflexes explains the fact that the stomach empties itself long before it has accomplished its proper work.

Pawlow[2] has shown that hydrochloric acid is a specific excitant of the pancreatic gland, but has no effect if it is retained in the stomach, or introduced into the jejunum. It acts only in the duodenum and it is here, and here only, that its powerful effect on the flow of the pancreatic juice is observed. Kelling's carefully conducted experiments not only confirm Pawlow's work, but show that the same thing is true for the flow of bile.

Hence the flow of both the pancreatic juice and bile is brought about reflexly by stimulation of the duodenum with hydrochloric acid, and this is in harmony with the fact that the flow of these fluids rises and falls in undulatory fashion with the entrance and exit of the acid food-mixture in the duodenum. Under conditions of gastro-enterostomy, a small continuous stream of bile and a very small stream of pancreatic juice flows, which are far below the demand of the normal intestinal digestion, and this explains the observations of Heinsheimer and Jesslin, that after gastro-enterostomy fats and albumins are, at best, only partially digested and a large part is recovered in the stool.

One of the functions of the sudden and excessive flow of bile and pancreatic juice upon the entrance of the acid stomach contents into the duodenum, is the neutralization of them, and we find, under normal conditions, an alkaline reaction of the contents of the jejunum. In gastro-enterostomy, where this does not occur, we find that not only does this acidity interfere with the action of the bowel ferments, causing imperfect digestion, but the irritation of the acid itself brings on functional disorders and severe diarrhœas which are very difficult to treat and may cause death. Two such cases are reported by Anschutz[3] from the clinic of Mikulicz. This diarrhœa is sometimes further complicated by an uncontrollable vomiting which is due to a mixed peristalsis just as in the case of peritonitis. Monprofit[4] has given the question considerable study and concludes that besides the factors already mentioned, there is a further irritation of the bowel mucosa by the sudden increase in diet reaching it. Matthes[5] injected artificial stomach secretions into the jejunum and in all cases brought on a catarrhal enteritis. Carle and Fantino[6] say that the diarrhœa in cases of reduced hydrochloric acid is due to an intoxication with fermentation products and thus explain the diarrhœa in cases of carcinoma.

In the jejunum, near the anastomotic opening, there is not uncommonly developed an ulcer, which may come on weeks or months after the operation. Tiegel[7] reports twenty-two cases in individuals operated for benign stenosis of the pylorus. Jahr[8] reports one case, and Watts[9] reports fourteen cases and includes an experimental observation of perforation of a jejunal ulcer in a dog following gastro-enterostomy. The clinical picture is variable; either there are no symptoms unless a perforation occurs, or there are present the usual picture of pain, and blood in stomach contents or in the stool. These ulcers resemble the peptic ulcers of the stomach, being often round and punched out in appearance.

Their etiology is obscure, just as in the case of ulcer of the stomach. But a causal rôle is undoubtedly played by the acid stomach contents which strike the jejunum unaccustomed to such an insult. Then, too, because of the premature emptying of the stomach the foods are coarse and cause mechanical injury. Kocher,[10] in reoperating some of his cases of gastro-enterostomy observed circular contractions of the bowel just below the anastomotic opening. Thus a cul-de-sac is formed, in which, owing to the prolonged contact of the food with the bowel, stagnation occurs and ulceration may follow.

As a further evidence of the baneful influence of the acidity, Tiegel points to the fact that these cases have all occurred in individuals who have had a gastro-enterostomy for benign disorders of the stomach, in whom the hydrochloric acid was normal or in excess. The occurrence of these jejunal ulcers is more frequent than suspected, for many remain latent and may give symptoms only at time of perforation.

The surgeon frequently has asked himself the cause of recurrence of symptoms in cases where the pylorus was not interfered with and a gastro-enterostomy done. This has had a rather ingenious explanation through the work of Kelling, who found that even with a large gastro-enterostomy opening, the food continues to pass by preference through the pylorus if it is at all patent. This is due to the peculiar anatomic arrangement of the musculature of the stomach, and is further influenced by the intra-abdominal pressure which more than equalizes the apparent advantage of a lower point. Owing to disuse, the artificial opening contracts and may even close.

The vicious circle, so common in the past, is unusual now, owing to the much-improved technique. But still cases occur in the hands of the most expert, no matter what type of operation is done and with no plausible explanation. For some obscure reason it has been found that there is a special liability to postoperative pulmonary complications in stomach cases, in particular, pneumonia and infarcts.

Most ulcers of the stomach heal medically if intelligently and persistently treated. Leube reports a medical cure in three-fourths of his cases. It is the complications of ulcer which alone may demand surgical interference. It is seldom that ulcers can be excised, for they are frequently multiple and when simple are usually so adherent to surrounding structures that their removal would be dangerous, if not impossible. Brenner,[11] in a careful review of the entire literature, advises against resection of ulcer in majority of cases, where gastro-enterostomy is done.

Likewise in hæmorrhage of the stomach, the bleeding point or points can seldom be found, and most surgeons admit that it is folly to operate while hæmorrhage is taking place unless distinct indications are present. Such bleeding is usually venous and, as a rule, is successfully checked by medical means. On the contrary, when repeated small hæmorrhages occur which menace the life of the patient, surgical means must be resorted to. Kocher, Quenu and Petersen, as well as others, report cases where the hæmorrhage continued and caused death, even when gastro-enterostomy was done.

CONCLUSIONS.

1. The stomach may be looked upon as an organ for the protection of the bowel. The normal functions cannot be improved upon by any operation, and gastro-enterostomy is at all times a dangerous operation.

2. The functional disorders of the digestive tract which occur after gastro-enterostomy and may seriously interfere with nutrition, and the severe diarrhœas which may come on, are due not only to the premature emptying of the stomach, but also to the failure of neutralization by the bile and pancreatic juice of these acid products. This deficiency of bile and pancreatic juice is due to the absence in the duodenum of the hydrochloric acid, which stimulates both of these to flow.

3. The numerous recorded cases of ulcer of the jejunum following gastro-enterostomy and their persistence of symptoms, if not fatal termination, lead us to advise gastro-enterostomy only as a last resort.

4. The neurasthenic individuals who suffer from chronic dyspepsia not only are not benefited by gastro-enterostomy but are made worse. This also applies to the dyspepsia due to imperfect mastication.

The so-called atonic dilatation of the stomach and gastroptosis, either alone or as a part of a general enteroptosis, never are benefited by gastro-enterostomy.

6. No operation is indicated in acute ulcer, unless perforation is imminent or has occurred, or serious hæmorrhage compels it.

7. Gastro-enterostomy is not indicated in chronic ulcer of the stomach, unless there are repeated small hæmorrhages which menace life, grave adhesions, or persistence of marked symptoms even after prolonged and thorough medical treatment.

8. Gastro-enterostomy should always be done where the natural evacuation of the stomach is impossible and pyloroplasty or gastro-duodenostomy are not feasible. This includes the cases with mechanical obstruction due to pyloric stenosis, and malformations due to hour-glass contractions or disabling perigastric adhesions. When the operation is done it is best to close off the pyloric opening.

BIBLIOGRAPHY.

[1] Langenbeck's Archiv., bd. 62, 1900.
[2] The Work of the Digestive Glands.
[3] Mitteil aus d. Grenzgeb., bd. xv, 1905.
[4] La Gastroenterostomie, Paris, 1903.
[5] Ziegler's Beiträge, bd. 13.
[6] Langenbeck's Archiv., bd. 56, 1900.
[7] Mitteil aus d. Grenzgeb, bd. 13.
[8] Berlin klin. Woch., 42, 1905.
[9] Johns Hopkins Bul. xiv, 1903.
[10] Die Verhand. d. Deut. Gesellschaft f. Chir., bd. xxxi, 1902.
[11] Archiv. f. Klin. Chir. lxxviii, Berlin, 1905.